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solved in much water, in which case a small quantity of sesquioxide of iron drops to the bottom of the vessel; if, however, the solution of the salt is concentrated, the separation of this oxide seems not to take place. The iron in this mineral varies in quantity, and he thought it might at times be entirely wanting, for magnesia and protoxide of iron may substitute each other, and for this reason he did not introduce it into the formula.

When he first determined the mineral, it was supposed to be Pickeringite, because the general appearance, the reactions with the blowpipe, its solubility, and all the elements contained in it are the same; only the quantitative analysis showed the differences in the ratios of the constituents.

Sonomaite occurs in silky, colorless crystals.

Specific gravity in alcohol of 95 per cent. = 1.982; in water it would therefore be = 1.604.

Klauer described (Gmelin's Handbuch der Chemie, 2, 315) a salt which differs from this only in having 3 æq. of water more.

Explorations in South America.—Prof. Cope stated that an expedition had been planned in this city for the exploration of the sources of the Madeira River, and of the eastern slopes of the Andes in Bolivia. Prof. James Orton had taken charge of the party, which included a corps of scientific assistants. As the region in question is the least known in South America, important results are anticipated. It was hoped that the Academy would be able to avail itself of these in the increase of its collections, etc. The expedition sailed on the 25th of October last.

November 14.

The President, Dr. Ruschenberger, in the chair.

Thirty-six members present.

A paper entitled "Note on a Cirripede of the Californian Miocene, with remarks on Fossil Shells," by T. A. Conrad, was presented for publication.

On Boussingaultite and other Minerals from Sonoma County, California.—Mr. E. Goldsmith stated that among the minerals brought by Dr. F. V. Hayden from Sonoma County, Cal., was one which he thought proper to call Boussingaultite. Although he had not been able to find in the current literature an analysis of the mineral to which Bechi had given this name in 1864, still he presumed that it might be that. It is stated, however, in Dana's Descriptive Min., p. 635, that Boussingaultite is mascagnite with some sulphate magnesia; whereas the mineral which Mr. G. analyzed seems to be sulphate magnesia ammonia. The mineral occurs in irregular granular masses, is soft, and easily rubbed to a perfectly white powder.

If heated in the tube, closed at one end, it affords water and a white sublimate, which latter is sulphate ammonia; in the bottom remained a white residue. On coal it gave, with solution of cobalt and strong ignition, the reddish coloration indicating the presence of magnesia. It is soluble in water. The solution showed the presence of sulphuric acid, magnesia, and ammonia.

The quantitative determination of the sulphuric acid and the magnesia was done with the air-dry substance; the amount of ammonium-oxide and water were calculated by means of those obtained data stöchiometrically.

$$\begin{array}{lclcl}
\dddot{\mathrm{S}} & = & 38.86 \text{ per cent.} & = & 23.31 \text{ oxygen.} \\
\dot{\mathrm{M}}\mathrm{g} & = & 15.56 \quad `` & = & 6.22 \quad `` \\
\mathrm{AmO} & = & 5.03 \quad `` & = & 1.54 \quad `` \\
\dot{\mathrm{H}} & = & 40.55 \quad `` & = & 36.04 \quad ``
\end{array}$$

The oxygen ratios of the acid and bases are—

$$\begin{array}{ccccccc}
\dddot{\mathrm{S}} & : & \dot{\mathrm{M}}\mathrm{g} & : & \mathrm{AmO} & : & \dot{\mathrm{H}}. \\
15.13 & : & 4.03 & : & 1 & : & 24.
\end{array}$$

Here are evidently five equivalents of sulphuric acid, and also the same number of equivalents of bases, hence the formulated expression—

$$4\dot{\mathrm{M}}\mathrm{g}\,\dddot{\mathrm{S}},\ \mathrm{AmO}\,\dddot{\mathrm{S}} + 24\dot{\mathrm{H}}$$

may be proposed.

The substance is nearly insoluble in alcohol of .818 specific gravity, at 70° F., it was therefore weighed in it, and its specific gravity found to be = 2.037; in water it would have the specific gravity = 1.666.

Mr. Goldsmith further called attention to the following minerals, which were all collected by Prof. Hayden in the same locality as those described above:—

Geyserite intermixed with a basic sulphate of iron and an oil, which is probably petroleum.

Epsomite or native sulphate magnesia occurs there, sometimes pure, occasionally mixed with geyserite.

Geyserite containing some sonomaite.

Mascagnite or native sulphate ammonia in white, irregular-shaped fragments.

Nodular geyserite seems to have been ground by the action of the motion of the geyser. Some of the nodules are nearly spherical; others spheroidal; a few in the collection are flattened, but always smoothly rounded; color white. They are nearly pure silica.

Sulphur is also a product of the geyser region. This element was noticed to be in very small crystals, which, when burned away, left at first a black carbonaceous matter; on heating to a high temperature, the carbon disappeared and a white ash remained.

Iron ochre containing a small quantity of arsenic. The reddish-brown powder has a peculiar disagreeable odor.

Kaolinite in the form of a pale blue, soft powder; on heating, the blue color disappears; if this substance is heated in the glass-tube, closed at one end, water is expelled which reacts alkaline; but on heating strongly, that is, to near redness, the reaction on litmus-paper indicates the presence of an acid.

Earthy geyserite containing some gypsum, and, at least, the flame-reaction of the presence of a minute quantity of potassa.

Although Mr. G. searched for chlorine or soluble chlorides, which as usual are widely distributed over the globe, in these cases, however, they seem to be absent. Whether in Sonoma County no chloride of sodium is found cannot be said at present with certainty; it is singular that none was noticed among those minerals which he had the opportunity to determine.

Cretaceous Vertebrates of the Upper Missouri.—Prof. COPE stated that he had recently returned from an exploration of the Judith River beds of the Upper Missouri, which were discovered by Dr. Hayden in 1855. Attention was given to the relation of this formation to the underlying marine cretaceous beds, and to the respective faunæ of the two as compared with that of the early eocene period. The fauna was found to be terrestrial and lacustrine, including great numbers of *Unionidæ*, *Lepidosteus*, *Myledophus* (a form probably of rays); of tailed *Batrachia*, crocodiles, fresh-water turtles, *Rhynchocephalia*, and Dinosaurian reptiles. The *Dinosauria* constitute the most abundant and characteristic form of life, eighteen species having been found, of which eight were of the carnivorous (*Goniopodous*) and ten of the herbivorous (*Orthopodous*) type. The predominant genus of the former is *Lælaps*, and of the latter *Dysganus*, of both of which several species were found.

The facies of this fauna is thus plainly mesozoic and cretaceous, adding weight to the arguments already adduced to this effect. But the change from the fauna of the underlying cretaceous numbers four and five is very striking, the genera and often higher groups being quite different. The types of the marine beds were found to be *Pythonomorpha*, *Elasmosaurus*, a genus allied to *Polycotylus*, *Enchodus*, chimærids, and sharks, with marine *Cephalopoda*, etc. Nevertheless, the physical transition between the marine and lacustrine formations appears to be complete, as indicated by Prof. Hayden.

Dr. Le Conte read the following report from the committee appointed, at the request of the Centennial Commission, to investigate and report upon the introduction of noxious insects and plants through the medium of the foreign exhibits in the exhibition :—